SEMI-YEARLY REPORT

(for July - December 2002)

Contract No. NAS596060

Enhanced Land cover and Land Cover Change products from MODIS
Post Launch Studies

by

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1. At-launch Land Cover Product.

a. Task Objectives:

The principal objective of this task is to supply a validated at-launch land cover product based on the AVHRR at a resolution of 1 km.

b. Task Progress:

Complete.

c. Anticipated Activities During the Next Semi-year:

No further activity.

2. Land cover change indicator product.

a) Task objectives

i) Generation of test data sets.

ii) Production and testing of the at-launch change detection algorithm.

iii) Production and testing of post-launch change detection algorithm, Vegetative Cover Conversion.

b) Task progress

i) Complete.

ii) Complete

iii) Efforts during the previous six months have concentrated on analysis of Collection 3 MOD44C data and their use for preparation of revised VCC Look Up Tables. Because the Collection 3 record for 250m resolution data does not provide global coverage over the span of an entire year (long-term problem due to IWG resource allocation decision), 500m monthly composites were used for areas where annual 250m data is still not available.

There was also considerable effort in preparation for the Collection 4 reprocessing, which will provide global 250m resolution data from first light forward. Due to upstream changes (more aggressive cloud flagging) certain MOD44C view geometry constraints had to be relaxed slightly. A robust version of the MOD44C code addressing these upstream issues was delivered for Science Test 3.5 and the results were very good. This version of the MOD44C code was integrated for Collection 4 processing and will produce a global 250m resolution dataset for all 7 MODIS bands based on a 16-day composite optimized for cloud free, near nadir views.

Reviews of our Collection 4 testing yielded a great deal of valuable QA information regarding upstream products which was circulated to the LDOPE and the responsible SCFs.

[Note: Due to a MODAPS operator error, these data were not produced globally in Collection 4 until data day 2000/097. From 2000/049 through 2000/096 a 30% global sample was produced.]

Field work to develop validation data sets for the land cover change caused by wildfire was conducted in recently burned areas of southern Oregon during mid August. This activity was conducted jointly with scientists from the USFS and resulted in a GPS data set in excess of 500 data points and associated digital photos. A web page for the activity was developed by the Earth Observatory and can be found at:

http://earthobservatory.nasa.gov/Study/BAER/

Annual VCC (MOD44A) results for the Mato Grosso Plateau, Brazil, as well as a description of the MOD44C composting method were presented as:

Townshend, J.R.G., Sohlberg, R.A., DeFries, R.S., Hansen, M.C., Carroll, M.L., DiMiceli, C., and Semeiks, B.M. 2002. The MODIS vegetative cover and change products: validation and analysis. **American Geophysical Union Fall Meeting**, San Francisco.

Various aspects of the joint efforts with the USFS were also included in the following presentation delivered by Rob Sohlberg:

Bobbe, T., Descloitres, J., Finco, M., Giglio, L., Justice, C., Sohlberg, R., and Townshend, J. 2002. MODIS Land Rapid Response System: implementation with USDA Forest Service and implications for active fire detection and land cover change products from future moderate resolution sensors. **NPOESS MAXI Review 2002,** Silver Spring, MD.

An additional presentation of the material was made by Mark Carroll at the 2002 USGS Wildland Fire Workshop.

c) Anticipated Activities during the Next Semi-year

i) No further activity.

ii) No further activity.

iii) Work during the next six months will concentrate on creating global VCC results for 2001 and 2002 using the Collection 4 reprocessed data. A parallel effort is ongoing with the USFS to create monthly burn severity maps and end-of-season summations for the conterminous United States and Alaska for 2002 (retrospective) and 2003 (near real-time).

Refinement of the flooding, burning and deforestation look-up tables derived using the available global Collection 3 500m resolution data will be replaced by LUTs derived from 250m resolution Collection 4 data.

3. Continuous fields of land cover properties

a) Task objectives

Generation of continuous fields of land cover attributes, Vegetation Continuous Fields.

b) Task progress

A 500m meter VCF tree cover data set was completed for November 2000-2001 and has been packaged in HDF format for delivery via the EDC-DAAC. This data set is also available in the Goode's projection from http://modis.umiacs.umd.edu. Preliminary herbaceous and bare cover layers have been prepared and will be released in early 2003.

Results were presented as follows:

Townshend, J.R.G., Sohlberg, R.A., DeFries, R.S., Hansen, M.C., Carroll, M.L., DiMiceli, C., and Semeiks, B.M. 2002. The MODIS vegetative cover and change products: validation and analysis. American Geophysical Union Fall Meeting, San Francisco.

John Townshend also participated in the MODLAND Vegetation Variables workshop in Missoula.

At their request, a meeting was held with Maryland Department of Natural resources to discuss use of the VCF data for forest monitoring within the state.

The VCF products were also delivered in a customized format to the USFS Forest Inventory and Analysis program for use in preparing more frequent forest inventory updates than are possible using ground-based methods.

Finally, the 500m VCF product has been delivered to the Millennium Ecosystem Assessment being sponsored by the UN Environment Program. The inclusion of this MODIS data set was requested by NASA-HQ. Hansen, DeFries and Townshend have been actively working with the MEA staff to assist them in utilizing the data.

c) Anticipated Activities during the Next Semi-year

Final versions of the Collection 3 VCF layers for herbaceous and bare cover will be delivered early in 2003. Further effort will concentrate on creating 2001, 2002 and 2003 VCF data sets using the improved Collection 4 data.

Collection of field data in Minnesota, Maine and possibly Paraguay is slated for 2003. This builds upon previous validation work in central and southern Africa and the western United States.

4. Overguide activities.

The SCF hosted Dr. Zhu, a forest remote sensing expert and Chinese Minister Science and Technology to discuss use of MODIS data for environmental monitoring in China.

John Townshend presented MODIS material at the George Mason University MODIS users workshop (October).

Finally, the global 500m mosaics used to derive the VCF product were packaged in GeoTIFF format and are being made available to the science community via the Global Land Cover Facility:

http://glcf.umiacs.umd.edu